

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#4

Applicant(s): ZHANG et al.

Group Art Unit:

Serial No.: 10/085,359

Examiner:

Filed: 2/28/2002

Title: ENERGY ACTIVATED
ELECTROGRAPHIC PRINTING
PROCESS

Attorney Docket No.: 321.087

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Commissioner for Patents
Washington, D.C. 20231

INFORMATION DISCLOSURE STATEMENT

Dear Sir:

This Information Disclosure Statement is submitted:

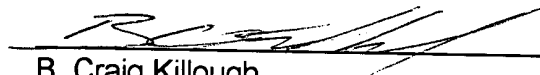
- ☒ under 37 CFR 1.97(b), or
(Within three months of filing national application; or date of entry of international application; or before mailing date of first office action on the merits; whichever occurs last)
- ☐ under 37 CFR 1.97(c) together with either a:
☐ Statement under 37 CFR 1.97(e), or
☐ a \$180.00 fee under 37 CFR 1.17(p), or
(After the CFR 1.97(b) time period, but before final action or notice of allowance, whichever occurs first)
- ☐ under 37 CFR 1.97(d) together with a:
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Serial Number: 10/085,359

X Applicant(s) submit herewith Form PTO 1449-Information Disclosure Citation together with copies, of patents, publications or other information of which applicant(s) are aware, which applicant(s) believe(s) may be material to the examination of this application and for which there may be a duty to disclose in accordance with 37 CFR 1.56.

It is requested that the information disclosed herein be made of record in this application.

Respectfully submitted,


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Dated: March 27, 2002

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CERTIFICATE OF MAILING

I hereby certify that this Information Disclosure Statement, PTO1449, along with copies of the prior art, are being deposited with the United States Postal Service, with sufficient postage attached thereto, in an envelope addressed to: Assistant Commissioner of Patents, Box NO FEE, Washington, D.C. 20231, on this 28 day of March, 2002.

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- ✓ Hashimoto, US patent 6,337,169, January 8, 2002, "Toner and image forming method
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- ✓ Tanikawa US patent 5,364,722, November 15, 1994, "Toner for developing electrostatic
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- ✓ Kasuya, US patent 5,354,639, October 11, 1994 "Color toner for developing electrostatic
 image comprising a polyalkylene having a crystallinity of 10-50%"
- ✓ Matsubara US patent 4,940,644, July 10, 1990, "Toner for development of electrostatic
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- ✓ Buckley, U.S. Patent No. 3,853,778, Dec 4, 1974
- ✓ OMalley, US patent 3967962, July 6, 1976, "Developing with toner polymer having
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- ✓ Polderman, US patent 4528257, July 9, 1985, Toner powder and method of forming fixed images
- ✓ Van Dusen, U.S. Pat. No. 4,990,424, D/87152, "Toner and developer compositions with semicrystalline polyolefin resin blends"
- ✓ Fuller, U.S. Pat. No. 4,952,477, "Toner and developer compositions with semicrystalline polyolefin resins"
- ✓ Fuller US patent 5,166,026, November 24, 1992 "Toner and developer compositions with semicrystalline polyolefin resins"
- ✓ Fuller, US patent 5,238,998, August 24, 1993, "Toner and developer compositions with liquid glass resins"

ABSTRACT

A process for printing images by means of an electrographic or electrostatic device using a dual-energy curable toner comprising energy-activation components including radiation-curable sites and reactive functional groups. Without substantially activating the reactive components, an image is formed during the process of printing the image onto a medium. Subsequently the reactive functional groups are activated upon applying the first energy source to promote adhesive strength of the image to the medium by cross-linking and bonding the image permanently onto the medium or another medium through a transfer process. A second energy source is applied either simultaneous with the first energy source or subsequent to the first energy source to promote cohesive strength of the image by cross-linking within the toner particles. The formed image is thereby permanently bonded onto the substrate with substantially enhanced resistance to chemical processes, such as cleaners or laundry products, to weather, radiation, and wearing.

BACKGROUND OF THE INVENTION

This invention relates to a printing process which involves producing an electrographic or electrostatic printing toner, printing an image by an electrographic or